



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,089	07/14/2003	Ionut E. Cardei	H0005633-1633	4692

7590 12/19/2006  
Honeywell International Inc.  
Law Dept. AB2  
101 Columbia Road  
Morristown, NJ 07962

EXAMINER
----------

ZEWDU, MELESS NMN

ART UNIT	PAPER NUMBER
----------	--------------

2617

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/19/2006	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/619,089

Applicant(s)

CARDEI ET AL.

Examiner

Meless N. Zewdu

Art Unit

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-9, 11-13, 17, 18, 21 and 27-29 is/are rejected.
- 7) ☒ Claim(s) 10, 14, 16, 19, 20 and 26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 6/7/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

### **DETAILED ACTION**

1. This action is the first on the merit of the instant application.
2. Claims 1-29 are pending in this action.

### ***Claim Objections***

Claim 17 is objected to because of the following informalities: the word "species" on line 1, need to be changed into the word "specifies". Appropriate correction is required.

Claim 23 is objected to because of the following informalities: the phrase /feature, "when the at least one node transmits, drops a time-critical frame –", is contradictory, a node cannot transmit and drop at the same time. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section

Art Unit: 2617

351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 7-9, 11-13, 15, 17, 18, 21 and 27-29 are rejected under 35

U.S.C. 102(e) as being Beyer et al. (Beyer) (US 6,791,997 B1).

**As per claim 1:** Beyer discloses a method scheduling transmissions in a wireless

Network (see abstract), the method comprising:

when a frame is received by a medium access control layer of  
receiving node (see paragraph 0044):

determining a next node transmit based schedule (see paragraphs 0022, 0026, 0030col. 8, lines 3948); the use of priority and identity, in the prior art, would makes to possible to determine the next node.

when the next node is different from a node that sent the received frame,  
terminating a current burst, wherein received frame is a part of the current burst, and  
inviting the next node to transmit a next burst (see paragraphs 0031, 0069); the priority  
bias, in the prior art, indicates that a node can be dropped in favor of another that meets  
the biasing criteria. Furthermore, a schedule is an invitation in advance and the next  
node is, thus, inherently invited. Making an invitation, in addition to scheduling, would be  
a redundant and resource consuming operation.

when the next node is the node that sent the received frame, allowing the current  
burst to continue be transmitted (see paragraphs 0027, 0030, 0069, 0092-0093); in the  
prior art, a node that has been scheduled or provided with priority bias, would have  
been identified and would be allowed to transmit.

**As per claim 2:** Beyer discloses a method, wherein the wireless network is an ad-hoc wireless network (see fig. 1; paragraph 0040).

**As per claim 3:** Beyer discloses a method, wherein terminating the current burst includes, when the current burst is a burst that is terminated with an acknowledgement frame, transmitting an acknowledgement frame to terminate the current burst (see paragraphs 0021-0022, 0028). Response is same as acknowledgement.

**As per claim 4:** Beyer discloses a method, wherein terminating the current burst includes terminating the current burst without transmitting an acknowledgement (see paragraphs 0027, 0043-0044). In the prior art, the operation is based on schedule which when the time is over, can terminate without acknowledgement or notice.

**As per claim 5:** Beyer discloses a method, further comprising the, when the frame is received by the medium access control layer of the receiving node (see paragraphs 0029, 0044):

When the next node is the receiving node, terminating the current burst, and initiating a transmission by the receiving node (see paragraphs 0043-0044). The prior art's adaptive schedule adaptively terminates and provides connections in the wireless ad-hoc network.

**As per claim 7:** Beyer discloses a method, wherein determining the next node to transmit based on schedule includes using bandwidth allocation in which each of a plurality of nodes is assigned a fraction of a schedule cycle (see paragraphs 0027, 0081-0088, 0043-0044).

**As per claim 8:** Beyer discloses a method, wherein the receiving node suspends transmission for the remainder of a current schedule cycle when all nodes assigned a fraction in the bandwidth allocation have used up their assigned allocation for the current schedule cycle (see paragraphs 0043-0044, 0051, 0082-0088). Dynamic indicates allocation is based on some demanding event; if no such an event exists, transmission can be suspended.

**As per claim 9:** Beyer discloses a method, wherein the schedule specifies a transmit order for the plurality nodes (

**As per claim 11:** the features of claim 11 are similar to the features of claim 1, except claim 11 is directed to an apparatus (receiving node) intended to perform the steps of method claim 1. Furthermore, a radio frequency sub-system and a control subsystem would have been inherent to the prior art's radio communication system (see also fig. 7). Hence, claim 11 is rejected on the same ground as claim 1 since the apparatus of claim 11 is required to the perform the steps of claim 1.

**As per claim 12:** the feature of claim 12 is similar to the feature of claim 2. Hence, claim 12 is rejected on the same ground as claim 2.

**As per claim 13:** the feature of claim 13 is similar to the feature of claim 3. Hence, claim 13 is rejected on the same ground as claim 3.

**As per claim 15:** Beyer discloses a node, wherein when the frame is received by the medium access control layer of the receiving node and when the next node is the receiving node (see abstract; figs. 1, 3 and 7), the control subsystem:  
terminates the current burst (see paragraphs 0027, 0089, 0077, 0093);

initiating a transmission by the receiving node (see paragraphs 0027, 0089, 0077, 0093). The schedule technique of the prior art would have been able to terminate the current burst, whose time is up, and initiate a transmission to a receiving node.

**As per claim 17:** Beyer discloses a node, wherein the schedule species a transmit order for a plurality of nodes (see fig. 1; abstract).

**As per claim 18:** Beyer discloses a node, wherein the control subsystem determines the next node to transmit based on the schedule by using a bandwidth allocation in which each of a plurality of nodes is assigned a fraction of a schedule cycle (see paragraphs 0027, 0081-0088, 0043-0044).

**As per claim 21:** the features of claim 21 are similar to the features of claim 1, except a dynamic set of nodes, wherein each of the set of nodes communicates with at least one other node over a wireless link, which is disclosed by Beyer (see fig. 1, paragraphs 0030, 0040, 0043-9944).

**As per claim 22:** Beyer discloses a network, wherein at least one node, when the at least one node transmits, selects a frame to transmit from a plurality of queued frames based on a priority assigned to each queued frame (see paragraphs 0026, 0043-0044, 0069).

**As per claim 27:** the features of claim 27 are similar to the features of claim 1, except allowing an out-of-order node to transmit out of the transmit order when the receiver is otherwise idle, which is disclosed by Beyer (see paragraphs (0043-0044); wherein the dynamic schedule of the prior art provides access/bandwidth to contender/s based on the situation/dynamic events for example, base on topology (see paragraph (0030); and

allowing a new node that is not specified in the bandwidth allocation to transmit when the receiver is otherwise idle, which is also disclosed by Beyer (see paragraphs 0006-0007, 0061, 0077, 100). Thus, claim 27 is rejected on the same ground as claim 1.

**As per claim 28:** the feature of claim 28 is similar to the features of claims 1, 11 and 27. Hence, claim 28 is rejected on the same ground as claims 1, 11, 27.

**As per claim 29:** the features of claim 29 are similar to the features of claims 1 and 27. Hence, claim 29 is rejected on the same ground as claims 1 and 27.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beyer in view of Oberman et al.

(Oberman) (US 2003/0026267 A1)

**As per claim 6:** Beyer does not explicitly teach about a method, wherein inviting the next node to transmit includes transmitting a ready-to-receive control frame, as claimed by applicant. However, in the same field of endeavor, Oberman teaches about virtual channel ready, wherein if no frame is currently being transmitted from a receiver to a transmitter, a virtual channel ready is sent using a special MAC control frame (see



paragraph 0219). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the teaching of Beyer with that of Oberman for the advantage of indicating that the receiver has emptied one or more receiver buffers and is ready to receive another packet (see paragraph 0218).

Claims 22 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references applied to claims 1 and 21 above, and further in view of Arikawa et al. (Arikawa) (US 6,754,215 B1)

**As per claim 22:** the above references do not explicitly teach about selecting a frame to transmit from a plurality of queued frames based on a priority assigned to each queued frame, as claimed by applicants. However, in the same field of endeavor, Arikawa teaches about a packet scheduling device, wherein accumulated packets/frames are selected based on priority class (see col. 3, lines 39-52). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the above references with the teaching of Arikawa for the advantage of efficiently scheduling variable length packets/frames with multiple priority classes (see col. 1, lines 5-10).

**As per claim 25:** Arikawa teaches a network, wherein at least one node enqueues data frames that are to be transmitted unless the data frame to be transmitted is a time-critical data frame and the data frame is not expected to be received at a destination node within a specified time period (see col. 3; lines 39-52).

Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the above references and further in view of Attimont .et al. (Attimont) (US 7,110,418 B2).

**As per claim 23:** the above references do not teach dropping a time-critical frame that is not expected to be received at a destination node in a specified time period, as claimed by applicant. However, in the same field of endeavor, Attimont teaches a technique wherein a real time packet/frame is either dropped if said data packet could not be successfully transmitted/delivered in a defined maximum time (see col. 5, lines 3948). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the above references with the teaching of Attimont so as to drop data/packet exceeding a defined delay time since it cannot be used for communication (see col. 2, lines 19-29).

**As per claim 24:** Attimont teaches a network, wherein the specified time is a time-to-live field included in a medium access control header of the time-critical frame (see col. 5, lines 39-48). A maximum delay time, within the context of the Attimont reference, is same as a time-to-live.

#### ***Allowable Subject Matter***

Claims 10, 14, 16, 19, 20 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Meless N. Zewdu whose telephone number is (571) 272-7873. The examiner can normally be reached on 8:30 am to 5:00 pm..

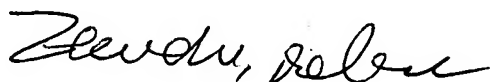
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Banks-Harold Marsha can be reached on (571) 272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Art Unit: 2617

Any inquiry of a general nature relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600

Meless zewdu

A handwritten signature in cursive script, appearing to read 'Zewdu, Meless'.

Examiner

08 December 2006